

DEPARTMENT OF HEALTH SERVICES

2151 BERKELEY WAY
BERKELEY, CA 94704



August 28, 1987

Commander
Western Division
Naval Facilities
Attn: Louise Lew, Code 1142E
P.O. Box 727
San Bruno, CA 94066

Dear Ms. Lew:

COMMENTS ON PROPOSED REMEDIAL INVESTIGATION FEASIBILITY STUDY
WORKPLAN, ALAMEDA NAVAL AIR STATION

We are writing in response to your request for input on the development of a Remedial Investigation and Feasibility Study (RI/FS) workplan for the Alameda Naval Air Station (ANAS).

We have reviewed the comments provided to you by the U.S. Environmental Protection Agency by letters dated June 30, 1987 and July 14, 1987. We concur with these comments.

We have also reviewed previous reports on the site, including:

1. Initial Assessment Study (IAS) of Naval Air Station, Alameda, California. April 1983.
2. Verification Step-Confirmation Study (VS-CS), Naval Air Station. May 1983 (Draft)
3. Confirmation Study-Characterization Step (CS-CS) work plan for Naval Air Station Alameda, California. February 1986 (Draft)

Based on this review, we have prepared the attached comments.

In addition, "Attachment A", is provided as guidance for development of a Remedial Investigation and Feasibility Study workplan.

Commander
Naval Facilities
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I look forward to receiving the RI/FS workplan. If you have any questions or comments, please call me at (415) 540-2054.

Sincerely,



Donald L. Cox
Associate Hazardous
Materials Specialist
North Coast California Section
Toxic Substances Control Division

cc: Nancy Wu
U.S. EPA

Donald Dalke
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San Francisco Bay Region

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COMMENTS ON PROPOSED REMEDIAL INVESTIGATION/FEASIBILITY
STUDY WORKPLAN, ALAMEDA NAVAL AIR STATION

The Department of Health Services has reviewed the following reports:

1. Initial Assessment Study (IAS) of Naval Air Station, Alameda, California. April 1983.
2. Verification Step-Confirmation Study (VS-CS), Naval Air Station. May 198~~2~~₅ (Draft)
3. Confirmation Study-Characterization Step (CS-CS) workplan for Naval Air Station Alameda, California. February 1986 (Draft)

Based on this review, the remedial investigation/feasibility study workplan should address the comments provided below.

AIRCRAFT INTERMEDIATE MAINTENANCE DEPARTMENT

A. BUILDING 41

1. Repair and cleaning of aircraft engine parts was an identified activity in this area. As of 1981, waste contained in 100 barrels was "stored" on the asphalt pavement, west of building 41. All but 19 were identified and removed. IAS-6-1.

a. No investigation of records or personal interviews were done. Why were the barrels removed?

b. No results of investigation are presented, which would identify specific areas of possible soil contamination.

c. No indication is given regarding waste storage practices, prior to paving with asphalt.

2. A three foot by five foot stripping tank may be a source of soil contamination. Rinsing of parts soaked in the tank may have resulted in soil contamination. Did this occur prior to paving, also?

a. The above rinse waters drained from the ground into a manhole linked to EBMUD. A need exist, to determine the integrity of the sewer system. Further, soil sampling around the manhole is also needed.

b. Depending on soil characteristics, deeper soil samples may also be warranted. If contamination of deeper soil is

discovered, shallow ground water samples should be collected and analyzed.

c. Samples should be analyzed for organic and inorganic chemical constituents to determine if the following chemicals or chemical constituents mixtures are present in soil or ground water:

- i. I. P. D. 680 dry cleaner;
- ii. Trichlorotrifluoroethane;
- iii. 6083 oil from the Magnaflux testing machine;
- iv. Probable constituent of identified paints used, including methyl ethyl ketone.
- v. MIL R 81294 caustic paint stripper;
- vi. Hydraulic fluid constituents;
- vii. Magnaflux Zyglo dye penetrant.

The above chemical compounds are identified as being used at the facility and could be found in this area. (Table 6-1 of the IAS 6-2).

B. NAVY EXCHANGE: SERVICE STATIONS

In 1980, rupture of an underground storage tank occurred. It was speculated that no soil or ground water contamination resulted, because the tank was below the water table. (IAS 6-4).

Nevertheless, the soil and ground water at the former location of the tank should be tested for the presence of petroleum hydrocarbons.

Building 459

In 1982, soil contamination resulted from leaking underground fuel lines, connecting an underground fuel tank. Standing water in trenches was observed to have a "...visible oil sheen...". (IAS 6-4).

Therefore ground water contamination is likely. The RI/FS workplan should fully address this area. The results of prior investigative work should be utilized to determine what additional work is needed.

Building 162

A service station was operated by the Naval Exchange there, prior to 1962 and before building 162 was constructed. (IAS 6-4).

1. No information is provided as to what happened to the

underground storage tank(s). Were they removed? Were they cleaned? Were they emptied? Is it possible the tank(s) still contain petroleum products?

C. Area 97

This storage facility area is adjacent to Building 162. (IAS 6-4). It is part of the Supply Department. Five underground fuel storage tanks, each with a 100,000 gallon capacity, are located in the building.

- a. Tanks A, B, C, and D were constructed in 1943. They are of concrete construction and lined carboline.
- b. Tank E was constructed in 1962 and is made of steel.
- c. All tanks were used exclusively for the storage of 115/145 AVGAS.
- d. In 1975 it was discovered that tanks A, C, and D were leaking and, in October of that year, they were drained, cleaned, and filled with water.
- e. In 1978, it was discovered that tank B was leaking. It, as well as tank E (the latter was not known to be leaking) were drained and filled with water. Tanks B and E were not cleaned however, and one to two inches of AVGAS remained on the water surface. (IAS 6-5).

A proposal was made (MCON-P-192) to remove the tanks, but not implemented.

Leaking fuel and gasoline vapors may present a threat to public health and safety and the environment. Particular problems identified are the sewer system on-site and manholes associate with electrical utility service in the vicinity of Area 97. In 1977, an explosion occurred. This explosion was caused by ignition of petroleum vapors. An electrical contractor was injured as result. Later in time, several evacuations were required of the Credit Union personnel, due to high vapor readings in Building 527 (immediately north of Building 97). (IAS 6-5).

Development of "alternative remedial measures" were attempted in 1979 by installation of 18 monitoring wells. No pooled fuel was found in any area about area 97. However a pellicular fuel residue was found above the water table. It was concluded by the Navy's consultant that the bulk of the fuel from Area 97 had drained away. It was suggested that the fuel probably went into a nearby storm drain and sanitary sewer,

particularly those sewers which run along Atlantic Avenue, immediately south of Area 97. (IAS 6-5).

However, soil and ground water contamination from area 97 was observed, about 500 feet north north-west of that area. However, the data generated may not be valid because it was noted that two wells were free of contamination, yet were each in the expected path of the plume (IAS 6-8). It was suggested that under a worst case scenario, substantially all of the 365,000 gallons of AVGAS could have migrated into the Seaplane Lagoon and then into the Oakland inner harbor.

Subsequent investigations involving the installation of soil borings and wells have resulted in findings of unnatural odors and significant concentrations of combustible gas. In one well (OW-14), combustible gas was also measured in significant levels. (VS-CS² IV-14).

Evidence of free gasoline on the ground water table (a sheen) was observed at two observation wells (OW-3 and OW-14).

Trenching from around well OW-36, toward the north encountered free "gasoline-like" liquid in the soil and on the ground water table with apparent concentration increasing northward toward Building 430; decreasing again until none was evident, north of Building 430. (VS-CS IV-14).

The greatest concentrations were found near building 109, west of building 430. A grab sample of ground water and free floating product contained approximately 3900 mg/L of "gasoline hydrocarbons". Although four tanks were sampled to determine liquid constituents, one tank was not sampled because entry would have been required. All tanks contained varying levels of combustible gas, none greater than 8% of the lower explosive limit of hexane. Lead was detected in all but two water samples, the highest concentration being 210 mg/l.

D. BUILDING 5

Four shops within building 5 have been identified: B-5 Plating Shop; B-5 Paint Stripping; B-5 cleaning Shop; and B-5 Paint Shop. (IAS 6-15 & 6-18).

1. B-5 Plating Shop

The hazardous materials which were and are used in this shop include: degreasing; caustic and acid etching; metal stripping and cleaning; and chrome, nickel, silver, cadmium, and copper plating. As a consequence of these activities, waste generated included rinse tank waste water, concentrated bath dumps, plating

tank sludges, caustic cleaners, and cyanide stripper bath dumps.

For a period of 33 years (1942 to 1975), at least 18,000 tons of waste were generated by this shop. Tank overflows regularly occurred. Through 1970 these overflows entered drains and were discharged to the industrial waste collection system untreated (IAS 6-15).

No mention is made as to the surface on which these spills occurred. Was the surface cement, wood or soil? Did spills occur which could have resulted in contaminated soil, under the building?

2. B-5 Paint Stripping-Shop (B348, B410)

Activities in this shop include paint stripping and conversion coating of air frame parts, use of a cleaning smelter, conversion coating, use of phenolic stripping chemicals, and use of ethyl acetate as a drying agent. Waste water generated by the above activities contain paint skins, solvents, and detergents. As a matter of course, these waste waters contain high levels of phenol (4,000 ppm), methylene chloride, chromium, and oil and grease.

Although paint skins were collected and removed by contractors, the liquid wastes were washed down the drain. Spillage of waste waters outside the industrial sewer drain pads occurred frequently. This resulted in the waste water discharges into the storm sewer (IAS 6-18).

No mention is made as to the potential for soil contamination as a result of these spillages outside the industrial sewer pads. Is there a potential for soil contamination? If so the nature and extent of contamination should be determined.

3. B-5 Cleaning Shop

Cleaning and paint stripping of aircraft parts in this shop involved the use of trichloroethane, carbon tetrachloride, and trichloroethylene. Rinsewater and paint stripping waste water were discharged through a floor drain that connects to the industrial waste water collection system. A daily flow rate of 25,000 gallons per day was reported in 1981 (IAS 6-18).

No inquiry was made or expressed as to whether leaks could have occurred outside of the floor drain, thus contaminating the underlying soil. If leaks occurred, the nature and extent of contamination of contamination should be assessed.

4. B-5 Paint Shop

Recirculated water from spray booth operations is stored in a point bay recirculation sump. Four times per year this sump is pumped, and the contents taken off-base. The typical flow rate of the spray booth operation is noted as 5,000 gallons per day. Chemicals found in this waste solution include chromium, iron, lead, zinc, and phenol. (IAS 6-18).

No description of the sump is provided. The existence of soil contamination under or around this building should be assessed.

E. NAVAL AIR REWORK FACILITY (NARF) ALAMEDA

The Naval Air Rework Facility includes buildings 5, 360, and 410. From 1943 until 1972 and in part of 1975 all wastewater generated by NARF activities was discharged untreated into the San Francisco bay via the Industrial Waste Collection System. This system emptied first into the Seaplane Lagoon and the Estuary and then the bay. The bulk of the wastewater was discharged via the Seaplane Lagoon. Other discharge points include the estuary and the pier area. (IAS 6-10).

All points of waste entry into sewer, drain and, or treatment system should be assessed for possible sources of soil and, or ground water contamination.

F. Building 114

Pesticides were stored in this building. Equipment used for pesticide application was rinsed off in the yard, and the pesticide laden water was allowed to drain into the storm drain system (which emptied into the Seaplane Lagoon). (IAS 6-8).

No indication is given regarding the possibility for soil contamination resulting from the course of these activities. This should be determined and, if appropriate, soil and ground water samples should be taken.

Approximately 250 gallons per day of waste water has been generated from steam cleaning, paint stripping, and paint spray booths activities. Although before the 1970's this waste stream was discharged directly into the storm drain which emptied into the San Francisco Bay (via the Seaplane Lagoon), the current practice is to collect this waste into a separator pit. Examination and analysis of this pit has indicated it inadequately separated sludges and floating scum. (IAS 6-35).

Inadequate separation of sludges and scum may be an indication that the separator pit became clogged resulting in overflow and spills of wastewater in or around the pit.

The possibility of soil contamination resulting from such overflows or spills should be assessed, and if appropriate, soil samples should be collected and analyzed.

G. BUILDING 301 AND 389

The initial assessment of buildings 301 and 389 indicates that approximately 200 to 400 gallons of PCB containing oil may have been present at any one time. The practice before 1974 was to store electrical transformers containing PCBs on the bare soil. Occasionally the PCB containing oil was drained and used to control weeds. This was done by spreading the oil on the ground adjacent to the transformer storage area. This practice coupled with proximity of the Oakland harbor could foreseeably have resulted in the release of PCBs into the harbor. (IAS 3-2).

It was recommended that hand-auger soil borings be drilled, three in the Verification Phase, and 15 to 20 in the Characterization Phase. Replicates of three, at depths of 0-6, 18-20, and 30-36 inches were further recommended. Analysis for PCBs only was suggested. (IAS 4-4).

In the Verification stage, 12 shallow soil samples were collected. Of these samples, only 10 were analyzed. Sampling was from 6 to 12 inches of either the underlying soil, or 4 to 6 inches from ground surface (which is unclear). Only PCBs were tested for (VS-CS IV-7).

Further investigation should be done using a more statistically sound sampling method, using a block design, calculated to rule out the presence of PCBs and other pesticides (herbicides) used at the base. Since no records, as to pesticide application practices have been presented, or the amount of PCB-laden oil which could have contaminated the soil, a broader sampling plan should be developed. Such a plan could be biased slightly toward J-1, J-3, J-5, and J-2 areas.

H. CANS C-2 AREA

Hazardous materials were stored near buildings 338-A through 338-H. Paints, solvents acids, and bases were stored outside in containers that leaked, corroded, or were open, resulting in spills.

PCBs were used for weed control until 1963. PCB transformers, the source of the weed control chemical, were known to have leaked on to the ground. As a result of these leaks, 10 cubic yards of PCB-containing soil was removed, in August 1982. Test of unknown methodology and sampling technique, reported the remaining soil contains less than one ppm. (IAS 2-7). Soil and ground water test resulted in the following relevant findings:

Ground water sample	Well-WA-6	Well WA-6
Sample date	10/18/84	1/22/85
Sample depth	6.0-6.5 ft.	6-26 ft.
Conductivity (uMhol)	33	2180
Ba mg/l	21	<0.1
Cd "	0.55	<0.1
Cr "	23	0.13
Co "	3.6	<0.1
Cu "	23	0.13
Pb "	<0.5	<0.1
V "	15	<0.5
Zn "	18	<0.1
2,4-D	<0.005	0.002
Combustible gases before pumping =25 ppm, after pumping =24% of LEL.		

Soil Samples
(mg/kg)
(core samples)

Well WA-6		Well WA-6
10/18/84		1/22/85
depth 5-6 ft.		
Ba	21	45
Cr	23	42
Co	3.6	6.0
Ni	19	36
V	15	18
Zn	18	100
Cd	0.55	5.8
Pb	<0.5	120

[VS-CS, Soil Analysis Report, Appendix III].

Test conducted in 1986 of ground water from well WA-6 resulted in the following findings:

Trichloroethylene	1.2 ppb
Bis-(2-ethylhexyl)phthalate	3.0 ppb
Dibutylphthalate	1.3 ppb
Arsenic	24 ppb
Chromium	27 ppb
Zinc	50 ppb

The above chemicals listed, represent a more comprehensive list. However, the quantity of these chemicals exceeded the Applied Action Level criteria established under DHS standards. A example is the pesticide Endrine listed under the Draft Confirmation Study (Characterization Step). Although the concentration measured for each pesticide were listed as less than one ppb, the applied action criteria for Endrine is 0.2 ppb. Under existing standards and analytical detection limits, resampling and analysis is warranted.

Trichloroethylene (TCE) is considered to be a human carcinogen. TCE was detected in all the ground water from well WA-6. Its concentration was found to be 1.2 ppb. Although the State Action level for this chemical is 5 ppb, the states Applied Action Level in 1.8 ppm. In addition, a variability of 40% in the results can be expected. Thus an Applied Action Level of 1.8 may be expected to vary between 1.1 ppb and 2.5 ppb.

Exceedences of State action levels for ground water contaminants were found in WA-6, when tested on 10/18/84. These chemicals which exceed State action levels include cadmium, chromium, copper, lead, zinc and 2,4-D. Barium was also above the State Applied Action Level. Although later test at deeper ground water levels indicated that the amounts of these chemicals were substantially lower, the analytical detection limits were higher than State action levels. Therefore additional testing of the shallow and deeper ground water should be done. Such testing should be done using detection limits which are below State Applied Action Levels.

Core samples taken during the drilling of well WA-6 were taken on October 18, 1987, as established above. "Total Heavy Metal Content of selected sediments..." were incorporated by reference in the Draft Report VS-CS (table 9). Included in this latter "... selected sediment..." tabulation, are levels found for cadmium, copper, lead, and zinc; for the Oakland outer harbor, turning basin, and Oakland inner harbor.

While the latter values may be in part applied to compare on-site sediment constituent levels with off-site values, these value will not provide insight as to the above core sample constituents. Further, the "Exploration Boring Log" presented indicates the soil composition was sand, down to 50 ft. Any attempt at making background comparison should be closely comparable.

Further investigation is warranted in the CAN - 2 area.

I. B-360 PAINTING SHOP

Four paint spray booths are operated whereby solvent vapors are controlled with a water curtain system, which filters air exhausted from these booths. The water is collected in a holding tank and reused until the contaminant levels become excessive. The water is then disposed of in 55-gallon drums, which are disposed off-site.

Two degreasers are operated in the paint shop. The primary degreasing solvent has been identified as 1,1, 1-trichloroethane. From 1950 to the late 1970's, trichloroethylene was used. Prior to 1950 carbon tetrachloride was used. Although these solvents are reused, spills have occurred and resulted in discharge into the sewer system.

(IAS 6-25).

The area around the sewer intake should be assessed as a source of soil contamination. The sewer system in the vicinity of the shop should be assessed for leaks.

Building 360 Cleaning and Blasting Shop

This shop uses baths of phenolic-based cleaners, alkaline-type cleaners, rust remover, cleaning compound, and caustics in the cleaning of metal parts. As a consequence of parts rinsing using of these chemicals, approximately 13,000 gallons per day of waste water is discharged into the industrial waste collection system. (IAS 6-25).

Areas around the waste water collection system's sewer entry should be assessed as a possible source of soil contamination.

J. BUILDING 360 PLATING SHOP

Operations in this shop include: paint stripping by blasting, chrome, lead, silver, and nickel stripping; plating waste water containing substantial quantities of cyanide-bearing rinse water all have been identified as collected without treatment, in the industrial waste collection system.

Approximately 5,400 gallons per day was generated by the system. Studies have indicated levels of cyanide at 4 ppb, and nickel at 6 ppm. IAS 6-23.

Chromium waste water is discharged at a rate of 2,700 gallons per day to the industrial waste units treatment facility prior to entering the industrial waste collection system.

From 1954 to 1975, these waste were discharged directly into the Seaplane Lagoon. Chromium waste water concentration typically where 40 ppm. (IAS 6-23).

Available field and laboratory information, provided by the Navy has verified the presence of contaminated soil, under the plating shop. Tests have shown cyanide concentrations in soil as high as 118 mg/kg. Results of soil pH testing under the plating shop ranged from 9.1 to 9.8. VS-CS IV-20.

Guidance for a proposed work plan for the Plating Shop "crawl space" was documented in an earlier report by a Navy contractor. (CS-CS III, P.1 - 1986).

K. BUILDING 10 - POWER PLANT

Two power plants are used to generate steam. Seven boilers were in operation until the early 1970's. Five boilers were taken out of operation and two new boilers were installed. The primary gas used as of 1983 is natural gas, with diesel fuel as a back-up.

Until the early 1970's, "Bunker C" fuel oil was used. It was stored in eight (one 24,000 gallon and seven 12,000 gallon capacity) underground tanks. They are located on the north side of building 10. Spills have been identified as having occurred. Bunker "C" fuel oil has been identified as having accumulated in the trenches used for steam pipes.

The practice, when spills occurred, was to skim the oil off. In the early 1970's, these underground tanks were filled with water and abandoned.

The soil and underlying groundwater should be assessed for Bunker "C" oil contamination. The investigation may, depending on type good of soil and Topological gradients, be concentrated on the north side of building 10.

L. SEAPLANE LAGOON

An average of 380,000 gallons per day of waste water was discharged into the Seaplane Lagoon. (IAS 2-5).

The sources of these waste water have been indicated above. Some relevant sources, and estimated intermittent daily flow rates are:

<u>Gallons per day</u>	<u>Source</u> (before 1975)
60,000	Electroplating, heat treatment, cleaning, stripping, photo lab
1,800	Overhaul parts, plastics, photo lab
42,000	Cleaning, paint booth, boiler water, service aircraft, conditioning equipment backwash.
29,150	Paint booths, equipment washing, cleaning and overhaul, tower bleed off (<u>IAS 6-75</u>).

The seaplane lagoon was dredged in the 1940's to a depth of 15 feet. Its average depth is 15-18 feet. Sludge and sediments since that time have accumulated in the basin. During the 1960's and 1970's, bottom paints from small boats anchored in the lagoon would occasionally dissolve (IAS 2-5).

Fish caught in the 1970's were reported to have strongly smelled of solvents, and were thus inedible (IAS 2-5).

Examination of the lagoon bottom in 1971 revealed a significantly depressed macrobenthic community (IAS 2-5).

Waste discharge operations into the lagoon have threatened the food chain for the California least tern. (IAS 3-2).

In 1981, approximately 21,000 cubic yards of material were removed from the southwest side of the lagoon, in the vicinity of Pier 1, the seawall, and the port services officer's building. This dredging material was disposed of at the on-site West Beach land fill (IAS 2-6).

The area of coverage for dredging is not reported, and no evidence exists that most of the lagoon has ever been dredged within the last thirty years. Shoals have been reported visible throughout the lagoon (IAS 2-6).

It should be noted that based on available maps (IAS 4-5), the Seaplane Lagoon covers approximately 467,000 square yards (~96.4 acres). In view of the presence of visible Shoals in the lagoon, suggesting areas of variable depth, it is reasonable the above dredging could have represented a relatively small area.

It is reported that maintenance activities on ships docked at Pier 1 and other piers have resulted in disposal of oil, bilge waste water, and other ship wastes from the 1940's to 1975. Aerial photos reveal that bay currents would have swept discharges from many of these activities into the lagoon. (IAS 6-67).

Analysis of sediment samples taken outside and inside the lagoon resulted in the detection of 10 of 17 and, 13 of 17 metals tested, respectively. The following chemicals were found in significantly higher concentrations inside the Seaplane Lagoon, compared to concentrations outside: cadmium, chromium, copper, lead, mercury and zinc.

Further soil sampling of the lagoon is necessary. The method and depth of sampling must be based on available information. Prior waste discharge practices, location of prior waste outpouring in the lagoon, and potential adverse affects to existing and foreseeable biological receptors.

M. WEST BEACH LANDFILL

This landfill was a disposal area for the site from about 1952 through March 1978. Other Naval sites disposed of their waste in this landfill, including the Oak Knoll Naval Hospital, the Naval Supply Center Oakland, and Treasure Island.

Waste types deposited in the landfill include: solvents, oily waste and sludges, paint waste, strippers, thinners, and sludges; plating waste; industrial strippers/cleaners; acids mercury; polychlorinated biphenyl (PCB) contaminated fluids and "TAC rags", batteries, radiological waste; scrap metal; "inert" ordnance; asbestos; pesticides, tear gas agents (CS and CSC); infectious waste, Creosote, and waste medicines and reagents. Estimates as to the amounts of waste disposed range from 30,000 tons to 500,000 tons.

Based on contract work done in 1977 (Project P-183), for the landfill closure was partly derived from groundwater sampling. Pursuant to that sampling, 14 wells were installed. Results of samples obtained from these well included low concentrations of oil and grease, sulfides, iron, nitrate, nitrogen, lead, phosphorus, nitrogen, and Methone derivatives.

In part, because these constituents were representative of only 1% by volume of the hazardous material, it was closed as a class II facility (IAS 2-1).

Inspection later of the area failed to find all wells which were represented to have been installed. No well drilling log have been found.

The area of the bay near the west Beach Landfill serves as a feeding ground for the California least term, an endangered species. Ingestion of contaminated food by animals in which the California least term depends for its own survival, could result in further endangerment. Sport fishing for striped bass and leopard shark could also be affected by the existence of contaminants from the landfill. A nesting ground for the flat fish near the landfill area is also threatened. (IAS 3-1).

In view of previous studies which have resulted in findings of inorganic and organic chemical contamination of ground water in the West Beach landfill, additional investigation is necessary. Further recommendations by Wahler Associate in 1986 have been reviewed and appear reasonable in relation to the then existing purpose.

Estuary

Approximately 150,000,000 gallons of waste, over a thirty year (1943-1975) period was discharged into the estuary.

(IAS 2-3).

Waste water discharged into Estuary before 1985:

<u>Flow rate</u> (gal. per day)	<u>Source</u>
17,400	Aircraft cleaning, paint spray booth,
7,300	Paint Spray booth, swimming pool
450 (intermittent)	Garbage equipment wash area

IAS 6-75.

Although dispersion and volatilization are factors which may mitigate contamination of the sea-bed area in the vicinity of the Estuary, more documentation is warranted. Additional soil samples should be conducted. The number and location of samples collected from the estuary should be statically significant. Chemicals tested should reflect the wastes discharged, and there reasonable degradation products. The effect, if any, of hazardous substances on the aquatic habitat in the vicinity of the Estuary should be assessed.

1943 - 1956 Disposal Area

This area encompasses 100-120 acres, and is located at the extreme north western corner of the Alameda Naval Air Station. It is situated on bay lands reclaimed by filling. Approximately 15-200 million pounds of hazardous and non-hazardous waste was buried there. (IAS 2-5).

This disposal area contains the following categories of waste: radiological waste, scrap metal, waste oil, paint washes, solvents and cleaning compounds, IAS 2-2 and 6-44.

This area is now recreationally developed. A jogging course traverses the area. A sheet and target range, baseball diamond, picnic area, and a recreational building are all located directly on top of this disposal area. (IAS 6-61).

In 1985, five wells were installed.

After pumping one well, 100% of the combustible gas limit was detected (hexane as standard). Ground water constituent levels were reported, but the detection limit reported was not sufficiently low enough to have regulatory meaning (VS-CS - Table 3).

For example, the MCL for Arsenic in water is 5.0 ppb, but the value given was not measured below 1000 ppb. Additional ground water analysis will be necessary, taking into consideration water quality criteria (drinking water and aquatic) established by State and Federal standards.

Although the gross alpha and beta measurements reported may not be valid one well (WA-2) resulted in a sample exceeding the recommended maximum contaminant levels, established for drinking water. It was noted that the ground water is not potable, thus suggesting drinking water standards may not apply. It was also noted that hydraulic test of wells suggest non tidally associated ground water bodies. No other data or evidence is presented to support the potable status of ground water on base. Additional information should be provided to substantiate this conclusion.

Gross beta radioactivity levels were exceeded (>50 pci/L) in three out of five ground water samples taken. Again the data is suspect, additional testing is warranted.

ATTACHMENT A

III. GUIDANCE FOR DEVELOPMENT OF A REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

1. Scoping Document. This Scoping Document should include the collection and evaluation of existing data, identification of remedial investigation objectives, identification of general response objectives for the Feasibility Study, and identification of data needs and investigation tasks for the RI/FS. The scoping document should describe or include the following items:

- (a) site characteristics with map;
- (b) waste characteristics, including;
 - (1) a list of all hazardous wastes and hazardous substances which were disposed, discharged, spilled, treated, stored, transferred, transported, handled or used at the site, including a description of their estimated volumes, concentrations, and characteristics (you may incorporate relevant portions of the IAS);
 - (2) a description of all manufacturing processes which are or were related to each hazardous substance, material, or waste, or which produced any hazardous waste; and
 - (3) past disposal practices
- (c) summary of existing data, including a summary of all air, soil, surface water, and groundwater data.
- (d) nature and extent of problem, including a summary of the actual and potential on-site and off-site health and environmental effects;
- (e) previous remedial response efforts;
- (f) identification of general response actions;
- (g) data needs;
- (h) recommendations for additional work to eliminate data gaps.

2. Preliminary Endangerment Assessment. The Preliminary Endangerment Assessment should be prepared using data previously gathered and should address the subjects described in detail in paragraph 13.

3. RI/FS Workplan Submission. An RI/FS Workplan should be prepared which addresses all the activities necessary to conduct a complete Remedial Investigation (RI) and Feasibility Study (FS) of the Site and any areas where there is a release or threatened release of hazardous substances from the Site. The RI/FS Workplan should specifically address agency comments. In addition, the Workplan should be developed and the activities under it in accordance with the following laws, and regulations:

- a. California Health and Safety Code.
- b. California Administrative Code, Title 22.
- c. Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended.
- d. National Oil and Hazardous Substances Pollution Contingency Plan, 40 Code of Federal Regulations (CFR), Part 300.
- e. Division 7 of the California Water Code.

4. Guidance Documents.

The following guidance documents should be followed in preparation of the Scoping Document, Preliminary Endangerment Assessment, RI/FS Workplan, and all other work conducted.

- (a) U.S. Environmental Protection Agency's (EPA's) "Guidance on Remedial Investigations Under CERCLA", dated June 1985.
- (b) EPA's "Guidance on Feasibility Studies Under CERCLA", dated June 1985.
- (c) EPA's "Guidance Document QAMS-005", dated December 1980.
- (d) EPA's "Superfund Public Health Evaluation Manual", dated October 1986.
- (e) EPA's "Superfund Remedial Design and Remedial Action Guidance", dated February 1985.
- (f) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846 3rd edition 1987.
- (g) EPA's "Community Relations in Superfund: A Handbook", dated October 1986.
- (h) Hazardous Waste Operations and Emergency Response, 29, CFR, Part 1910.120, dated December 1986.
- (i) "Preparation of a U.S. EPA Region IX Sample Plan", dated November 1986.
- (j) DHS "Site Safety Plan outline and Guidance for Site Assessment or Site Mitigation", dated 1987 (Attachment B)

5. RI/FS Workplan Objectives. The objectives of the RI/FS are to:

- a. Determine the nature and full extent of contamination of air, soil, surface water and ground water at the Site and adjacent areas;

b. Identify all existing and potential migration pathways, including the direction, rate and dispersion of contaminant migration;

c. Determine the magnitude and probability of actual or potential harm to public health or welfare or to the environment by the threatened or actual release of hazardous substances or hazardous wastes at the Site;

d. Identify and evaluate appropriate remedial actions to prevent future releases and mitigate any releases which have already occurred; and

e. Collect and evaluate the information necessary to prepare a Remedial Action Plan in accordance with the requirements of Health and Safety Code Section 25356.1.

6. RI/FS Workplan Contents. The RI/FS Workplan should address, at a minimum, each of the following elements:

- a. Project Management Plan
- b. Sampling Plan
- c. Past Data Validation
- d. Quality Assurance/Quality Control Plan
- e. Data Management Plan
- f. Health and Safety Plan
- g. Endangerment Assessment Plan
- h. Feasibility Study Plan
- i. Community Relations Plan
- j. Schedule

7. Project Management Plan. A Project Management Plan should be prepared which describes how the project will be managed by RP and its contractors, subcontractors, and consultants. It should include an organization chart with the names and titles of key personnel and a description of their individual responsibilities.

8. Sampling Plan. A Sampling Plan should be prepared which describes the activities which will be undertaken to develop a complete profile of on-site and off-site air, soil, surface water and ground water contamination attributable to operations and activities at the Site. The plan should reference and utilize the guidance document, "Preparation of a U.S. EPA Region 9 Sample Plan", and should at a minimum describe or include the following items:

- (a) investigation objectives;
- (b) site background;
- (c) A summary analysis of existing air, soil, ground water and surface water data, including the rationale for the locations and types of analyses previously conducted;
- (d) chemical parameters of interest
- (e) sample types;
- (f) map of locations to be sampled;
- (g) sample locations and frequency;
- (h) engineering specifications for all sampling installations such as ground water monitoring wells, soil borings, and piezometers;

- (i) analytical procedures;
- (j) provisions for gaining access to and obtaining samples from adjacent properties, where appropriate; and
- (k) operational plan and schedule.

9. Past Data Validation. Past data which RP believes was generated in accordance with EPA QA/QC requirements (EPA's Guidance Document QAMS-005 dated December 1980) should be validated. If this validation cannot be documented, a representative number of samples should be collected and analyzed to verify past results. (See Attachment A)

10. Quality Assurance/Quality Control Plan. A Quality Assurance/Quality Control (QA/QC) Plan should be prepared which describes the procedures for the collection, preservation, and transport of samples; the calibration and maintenance of instruments; and the processing, verification, storage, and reporting of the data. The plan should reference and utilize EPA Guidance Document QAMS-005 and should specifically describe:

- (a) sample identification procedures;
- (b) sample preservation procedures;
- (c) chain-of-custody procedures;
- (d) EPA-approved analytical methods which may be used; and
- (e) the certified laboratory or laboratories which will perform the analyses.

11. Data Management Plan. A Data Management Plan should be prepared which describes how all technical data will be managed and preserved in accordance with paragraph 6.15.

12. Health and Safety Plan. A Health and Safety Plan should be prepared which prescribes the specific personnel, procedures and equipment to be used during field activities to protect the health and safety of the investigative team and the general public from exposure to hazardous wastes or hazardous substances. The plan should be prepared in accordance with "Hazardous Waste Waste Operations and Emergency Response, 29, CFR, Part 1910.120, dated December 1986", and should reference and utilize DHS "Site Safety Plan Outline and Guidance for Site Assessment or Site Mitigation Projects ", (Attachment B).

13. Endangerment Assessment Plan. An Endangerment Assessment Plan should be prepared which describes how the magnitude and probability of actual or potential harm to public health or welfare or the environment by the threatened or actual release of a hazardous substance or hazardous waste will be determined. The Endangerment Assessment Plan should be based on the Preliminary Endangerment Assessment and should describe how the following items will be identified and characterized:

- (a) hazardous substances and/or hazardous wastes present in all relevant environmental media (e.g., air, water, soil, sediment, and biota);

- (b) environmental fate and transport mechanisms within specified environmental media;
- (c) intrinsic toxicological properties of human health standards and criteria of specified hazardous substances or hazardous wastes;
- (d) exposure pathways and extent of expected or potential exposure;
- (e) population at risk; and
- (f) extent of expected harm and the likelihood of such harm occurring.

14. Feasibility Study Plan. A Feasibility Study Plan should be prepared which describes how the Feasibility Study will be performed. The objective of the Feasibility Study is to identify a remedial action or set of remedial actions which will permanently prevent or minimize the release of hazardous substances or contaminants from the Site so that they do not migrate or cause substantial danger to present or future public health and welfare or the environment. This objective should be accomplished through the identification, development, and evaluation of remedial action alternatives with respect to technical, public health, environmental, institutional, and cost considerations. The Feasibility Study Plan should include, at a minimum, the following items:

- (a) A summary of the existing and potential hazards for which corrective action may be required;
- (b) A description of the alternative remedial actions which will be evaluated;
- (c) A list of the technologies which will be screened for each alternative remedial action described in (b) above;
- (d) A description of the public health, environmental, and cost factors and criteria which will be considered in screening and analyzing each alternative remedial action technology, including, but not limited to, effectiveness, reliability, timeliness of implementation, unit cost, availability, operation and maintenance costs, and conformity with applicable laws and regulations;

15. Community Relations Plan. A Community Relations Plan should be prepared which describes how the public and the adjoining community will be kept informed of activities conducted at the Site under this Consent Order. The Community Relations Plan should reference and utilize the following guidance document: "EPA Community Relations in Superfund: A Handbook", dated October 1986.

16. Schedule. A schedule should be prepared which provides the time frames and dates of completion for each activity conducted under the RI/FS Workplan.

17. RI/FS Workplan Implementation. ANAS should implement the RI/FS Workplan as approved by DHS in accordance with the approved schedule.

18. Remedial Investigation Report. A Remedial Investigation Report should be submitted by the RP to DHS for review and approval in accordance with the approved Workplan schedule. The Remedial Investigation Report should summarize the results of the Remedial Investigation including presentation and interpretation of all data and information generated and/or compiled during the Remedial Investigation. The Remedial Investigation Report should address the following subjects relating to the Site:

- a. Introduction
 - 1. Overview of Report
 - 2. Site Background Information
 - 3. Nature and Extent of Problem(s)
 - 4. Remedial Investigation Summary
- b. Site Features Investigation
 - 1. Demography
 - 2. Land Use
 - 3. Natural Resources
 - 4. Climatology
- c. Hazardous Substance Investigation
 - 1. Waste Types
 - 2. Waste Component Characteristics and Behavior
- d. Hydrogeologic Investigation
 - 1. Soils
 - 2. Geology
 - 3. Ground Water
- e. Surface Water Investigation
 - 1. Surface Water
 - 2. Sediments
 - 3. Flood Potential
 - 4. Drainage
- f. Air Investigation
- g. Biota Investigation
 - 1. Flora
 - 2. Fauna
- h. Public Health and Environmental Concerns
 - 1. Potential Receptors
 - 2. Public Health Impacts
 - 3. Environmental Impacts

19. Feasibility Study Report. The Feasibility Study Report should be submitted to DHS for review and approval in accordance with the approved RI/FS Workplan Schedule. The Feasibility Study Report should summarize the results of the Feasibility Study including presentation and interpretation of all data and information generated and/or compiled during the Feasibility Study. The Feasibility Study should address the following subjects relating to the Site.

- a. Description of Current Situation
 - 1. Site Background Information
 - 2. Nature and Extent of Release
 - 3. Objective of Remedial Action(s)
- b. Description of Remedial Action Technologies
 - 1. Pilot Studies
 - 2. Bench Tests

- c. Screening of Remedial Action Technologies
 - 1. Technical Criteria
 - 2. Remedial Action Alternatives Developed
 - 3. Environmental and Public Health Criteria
 - 4. Other Screening Criteria
 - 5. Cost Criteria
- d. Analysis of Remedial Action Alternatives
 - 1. Technical Feasibility
 - 2. Environmental Evaluation
 - 3. Institutional Requirements
 - 4. Public Health Evaluation
 - 5. Cost Analysis
- e. Recommended Remedial Action

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**SITE SAFETY PLAN OUTLINE AND GUIDANCE
FOR SITE ASSESSMENT
OR SITE MITIGATION PROJECTS**

Toxic Substances Control Division

This document is intended to assist contractors and responsible parties in preparing site safety plans (SSP's) for Toxic Substances Control Division projects. This guidance is ~~is not~~ necessarily all-inclusive. The type of plan required and its content will vary on a site-specific basis. However, most SSP's will need to address, at a minimum, all of the topics listed in the SSP Outline below; if a topic area does not relate to the project, a negative declaration should be included to establish that adequate consideration was given to the topic.

A well-written SSP should be a stand-alone document that serves a multitude of purposes. While assuring the governmental agencies involved that both worker and community health and safety concerns are properly addressed, it should also provide site management with information that is sufficiently detailed to permit implementation of all health and safety functions at the site. A reference copy of the SSP must always be available at the site for this purpose. The SSP must also provide site workers with appropriate health and safety guidance, and be useful for training the workers in the hazards specific to the particular job.

It is advisable to have the SSP developed by industrial hygiene and safety personnel who have hazardous waste site experience. A suggested reference for use in preparing SSP's is the NIOSH/OSHA/USCG/EPA "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities", October 1985, DHHS (NIOSH) Publication No. 85-115.

I. SSP Outline

1. Facility Background
2. Key Personnel and Responsibilities
3. Job Hazard Analysis
4. Risk Assessment Summary
5. Air Monitoring Plan
6. Personal Protective Equipment
7. Work Zones and Security Measures
8. Decontamination Procedures
9. General Safe Work Practices
10. Emergency Response Plans
11. Training Requirements
12. Medical Surveillance Program
13. Documentation
14. Regulatory Requirements

II. Guidance Information

1. Facility Background

If the SSP is not an integral part of a workplan, this section of the SSP should be devoted to a description of the project,

including field activities and goals. Further, it should include a summary of information regarding wastes disposed of on-site, location and physical state of wastes, chemical characteristics of wastes, and range of concentrations found to date by matrix.

2. Key Personnel and Responsibilities

Identify key personnel by name and specific assignment for the project (i.e., Joe Smith, Project Manager, Harry Jones, Site Safety Officer, etc.). Summarize the health and safety responsibilities of each key person identified. Include the telephone numbers of key contractor/responsible party and agency personnel.

3. Job Hazard Analysis

This section is necessary to provide summary information on potential hazards to workers at the site. Describe potential chemical hazards based on contaminants present or expected, and the primary health risks associated with each; include PELs/TLVs for each contaminant as appropriate. Describe physical hazards associated with each site activity (i.e., trenching, drilling, sampling) and steps to be taken to minimize these hazards.

Provide anticipated weather conditions, including historic mean temperatures and relative humidities. If heat stress potential is indicated (ambient temp >70F), discuss its monitoring and control. In colder regions, give consideration to cold stress potential.

Where trenching or drilling will be conducted, ensure that Underground Service Alert (USA) is contacted for guidance regarding underground utilities. Article 6 of the Construction Safety Orders contains specific regulatory requirements for trenching operations.

Some large/prolonged/complex site mitigation projects will require a more detailed job hazard analysis for each job classification on the project.

4. Risk Assessment Summary

Provide a summary of the potential risks/impact on receptors at or near the site. This will include impact on workers, nearby/surrounding community, and environment. This section is very dependent on the availability of data and specifics regarding the site; therefore, based on the phase of the project (i.e. initial site assessment) it may not be possible to include this information.

5. Air Monitoring Plan

Describe area, worker, and community air monitoring programs. This should include rationales, methodologies, equipment calibration procedures for each, and locations for area and community monitoring. Include decision matrices for action level determinations. Depending on the geographic location of the site, area and community monitoring of the site may not be applicable. If the operation requires a local air quality agency permit which

outlines community air monitoring criteria, provide a copy of the permit as an appendix.

6. Personal Protective Equipment (PPE)

Discuss protective clothing and respirator selection. This must be more specific than "chemical resistant" coveralls, gloves, etc., and should include rationale for selection.

For respirator use, include odor threshold of gases and vapors, vapor pressure, and PEL/TLV of each hazardous constituent of primary concern, as well as action levels for upgrade or downgrade.

The section should include a list of PPE selected for each job classification at the site if there are different levels of protection being specified.

7. Work Zones and Security Measures

Provide a site and area map with work, contamination reduction and support zones outlined. Indicate decontamination area. Define site control/security measures; these include items such as fencing, locked gates, security guards, flagging, etc.

8. Decontamination Procedures

This section will describe decontamination (decon) procedures to be used for personnel, personal protective equipment, sampling equipment, and heavy equipment. Detail the decon procedures, including how decon line and rest area will be set up, provisions for disposal of contaminated materials and water, and a listing of decon equipment and solutions that will be used (i.e. soap and water, steam cleaner, etc.)

9. General Safe Work Practices

This section should establish Standard Operating Procedures (SOP's) for activities that can be standardized due to their repetitive nature. A checklist is advisable because it is useful in the field for daily checks of working conditions. If such safety SOP's are provided through a corporate health and safety program/manual, these can be referenced in the SSP, and a copy of the manual provided for review.

10. Emergency Response Plans

This is another section of the SSP which is very dependent on the specifics of the site and the phase of the project. At a minimum, it should describe medical and emergency services to be used, including a list of emergency contact telephone numbers and the route to the nearest emergency room. Personnel with current CPR/First Aid training need to be identified. Decontamination requirements for personnel injured or exposed in the work zone will be provided.

As applicable, based on the project, develop contingency plans for

on-site and off-site spills or releases of hazardous materials which will include evacuation plans for site and surrounding areas.

11. Training Requirements

This section should describe personnel training programs, which should include as a minimum, health hazard recognition training, physical agent (safety) training, respiratory protection training, equipment training, safe work practices, first aid/CPR, and personal hygiene. Procedures for daily/pre-shift tailgate safety meetings should be discussed.

Cal/OSHA requires specialized training be given when handling specific materials, and that personnel are trained in the hazards specific to their job.

If the details on such a training program are provided through a corporate health and safety program/manual, this can be referred to in the SSP, and a copy of the program or manual provided for review. The SSP should include training needs over and above the basic corporate program which are specific to the project.

12. Medical Surveillance Program

Any contractor/subcontractor who has employees working at hazardous waste sites should have an established medical surveillance program in place. At a minimum, the corporate program should include a determination that a worker can use respiratory protection devices; a determination of physical condition to withstand stresses such as heat stress; establish baseline conditions for hearing and visual acuity; blood tests and urinalysis; and provisions for followup/periodic examinations.

If such a program is included in the corporate health and safety program, it may be referenced as such in the SSP and a copy of the program submitted for review. However, appropriate tests or examinations for acute exposures to specific potential hazards from the work at hand should be discussed in this section of the SSP.

13. Documentation

There are many requirements in the Cal/OSHA health and safety regulations (CAC, Title 8) covering recordkeeping. Such items include worker exposure monitoring, medical surveillance, training, respiratory protection, and injuries/illnesses. Standard formats for these requirements should be established by the corporate health and safety program/manual. These can be referenced in the SSP, and a copy of the manual provided for review.

14. Regulatory Requirements

California Administrative Code, Title 8, General Industry Safety Orders sets out specific industrial hygiene, safety and medical monitoring requirements that are to be adhered to when working with designated hazardous materials. Frequently these procedures state that they do not apply to the construction industry. Cal-OSHA does

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not recognize hazardous waste site work as being in the construction industry; therefore, it is incumbent upon contractors/responsible parties to ensure that SSP's for site that contain any of these materials are in compliance with applicable regulations.

III. Resources

The TSCD staff includes industrial hygienists in each Regional Office who are available to assist in the development of SSP's. The primary responsibility for the SSP lies with the contractor/responsible party. However, the TSCD industrial hygienists are responsible for review and approval, prior to any site activities, of the SSP and any other health and safety considerations for a specific project. Verbal communications between the parties preparing the SSP and TSCD industrial hygienists is encouraged as this usually results in more expeditious approval of the SSP, which will then decrease the waiting period before site activities can begin.

In terms of written materials, the EPA provides additional guidance documents regarding site safety and SSP development.

Contractors who are working directly for the TSCD should consult their contracts or task orders for items which may be required in an SSP over and above the basic requirements detailed in this document.